

A Sodium Battery Using Room Temperature Ionic Liquids

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Submitted to the Battery Session,
Electrochemical Society Joint San
Francisco Meeting
September 2-7, 2001

New developments in the research on room- temperature ionic liquids has shown that large electrochemical windows may permit the near-reversible plating and stripping of alkali metals, such as lithium and sodium, at room temperature. We have been examining such liquids as methanesulfonyl chloride-aluminum chloride and ethylmethyl sulfone with added lithium and sodium salts, such as the tetrachloroaluminate, chloride and imide. Using standard cyclic voltammetry, chronoamperometry as well as an electrochemical quartz nanobalance, we have found nearly reversible plating/stripping in some of these systems. The results are highly dependent upon the electrode substrate, indicating an initial alloying process is dominant. Additionally, some potential cathode systems have been identified. Results will be discussed for all systems, with both lithium and sodium as the anode.